

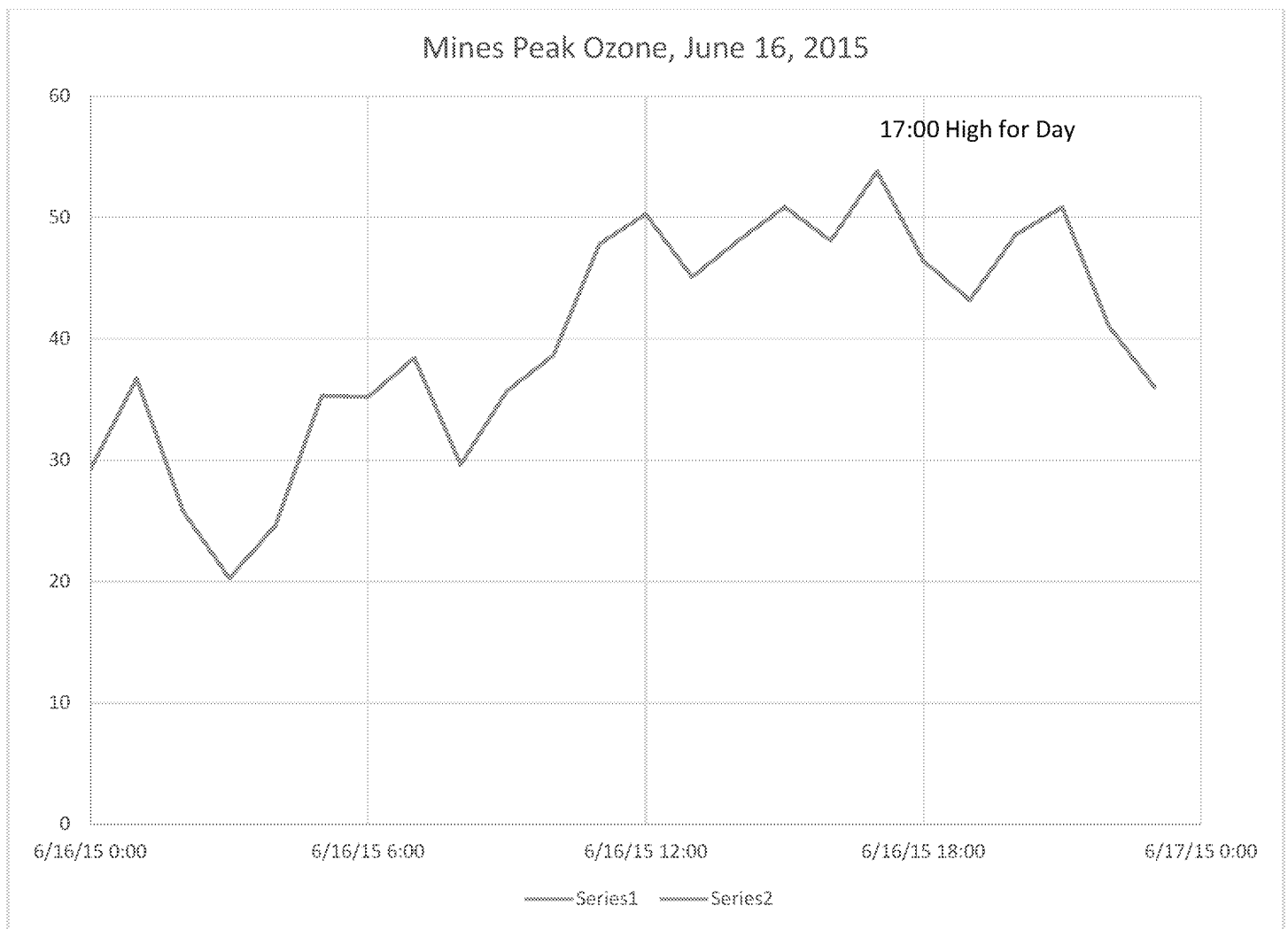
Message

To: Gordon Pierce [Gordon.Pierce@dphe.state.co.us]; Greg Harshfield [gregory.harshfield@state.co.us]
Subject: RE: Lightning Induce ozone and Mines Peak: A couple of 2015 Lightning Strikes identified

It would be interesting to see if you can see short term ozone spikes coincident with these lightning strikes; both are in the period nulled out in AQS due to failed QC checks. I think you provided me a copy of the nulled data shown in my plots below; for June 16, the high hourly ozone of the day coincides with the lightning strike time, while for July 1, the lightning at 12:27 is in an hour with lower ozone than the surrounding hours.

July 5, 2015, 13:45:06, MST

July 1, 2015, 12:27:43 MST





NOAA's Severe Weather Data Inventory

Search By Location:

Enter address, city, zip or 'lat,lon' coordinates: (ex: 34.5,-90.5)

39.795, -105.7636

Select Year and Dataset

2015

Filtered Storm Cells (Max Reflectivity >= 45 dBZ) from NEXRAD (Level-III Storm Structure Prod)

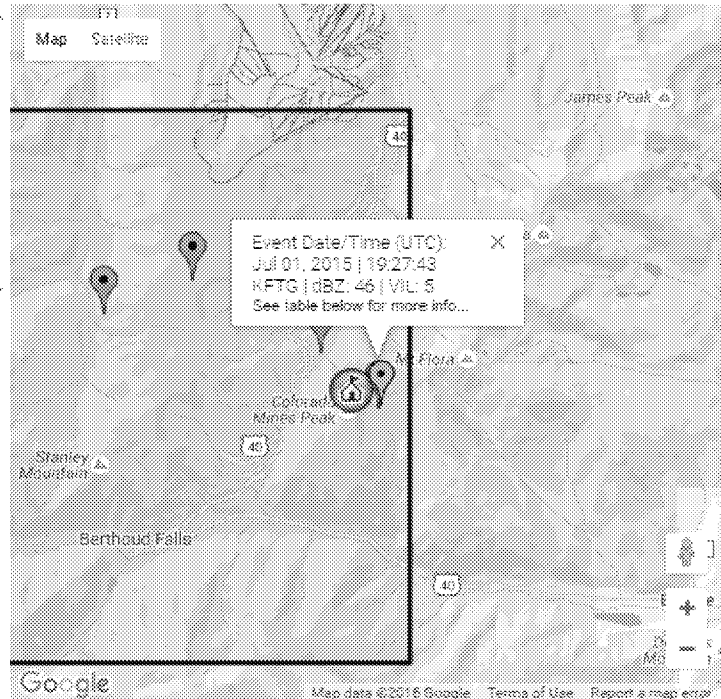
Data Table and Map

Timeline Graph

- Click on map to select new tile -

[Download Summary Data: [CSV](#) / [JSON](#) / [XML](#)]

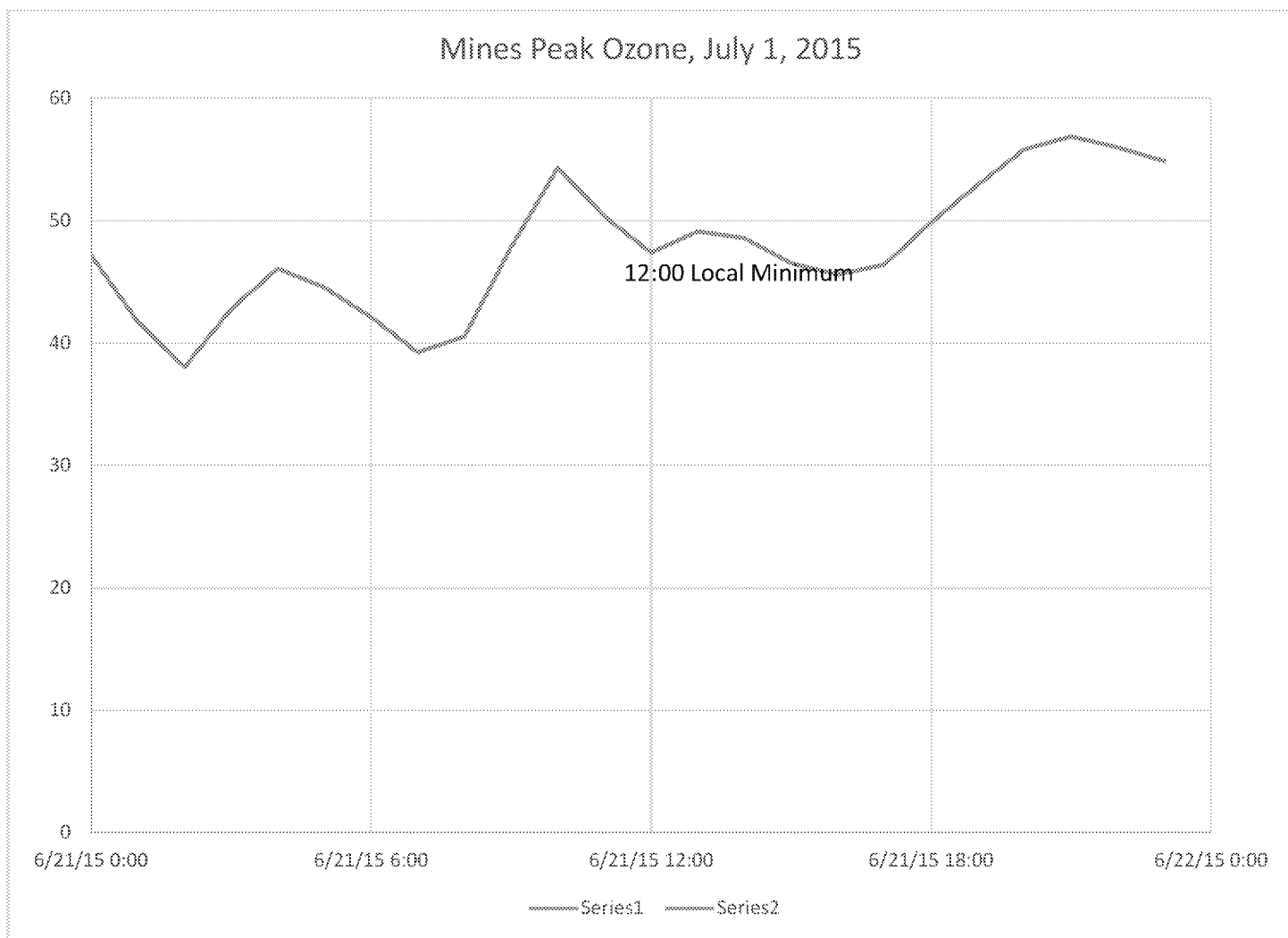
DATE (UTC)	NUM
May 28, 2015	2
Jun 13, 2015	5
Jun 17, 2015	8
Jul 1, 2015	7
Jul 5, 2015	3
Jul 21, 2015	1
Aug 16, 2015	5
Aug 17, 2015	1



Feature Count: 7

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DATE TIME(UTC)	RADAR ID	CELL ID	RAN. (nmi)	AZ. (nmi)	VIL	DBZ	LATITUDE
Jul 01, 2015 00:34:33	KFTG	G6	59	272	3	45	39.813



From: Payton, Richard

Sent: Wednesday, April 06, 2016 8:19 AM

To: Gordon Pierce <Gordon.Pierce@dphe.state.co.us>; Greg Harshfield <gregory.harshfield@state.co.us>

Subject: Lightning Induce ozone and Mines Peak

Gentlemen:

Atmospheric science textbook statements attribute some contribution to background ozone as coming from lightning. My grad school based perception is that lightning induced NOx is the primary path for this background source; this is reflected in our background ozone white paper (<https://www.epa.gov/sites/production/files/2016-03/documents/whitepaper-bgo3-final.pdf>): "Other natural sources of O3 precursor emissions include wildfires, lightning, and vegetation."

On the other hand, it is being suggested that thunderstorms/lightning should be a new class of ozone exceptional events. I have to admit, I did smell ozone during the thundersnow in Denver last week (or the week before?). The odor threshold for ozone is variously given as 8 to 30 ppb (or higher), so that would imply we should be able to see at least short term ozone enhancement during thunderstorms on monitors.

I am thinking that looking at high resolution ozone data from Mines Peak would be a good way to look for lightning induced ozone magnitude and duration. Doing that would depend on identifying thunderstorms in the area, or, better, lightning strikes on the peak. I don't know if any of your neighbors on the peak are running lightning sensors, or if I can find access to regional lightning strike maps, but I thought I would float the idea with you and ask if you know of lightning strike data that would make this search practical.

Let me know if you know of an appropriate data source.

Richard
(303) 312-6439